



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/802,388

03/17/2004

Walter C. Hernandez

5579-47

3689

20792 7590 02/01/2010
MYERS BIGEL SIBLEY & SAJOVEC
PO BOX 37428
RALEIGH, NC 27627

EXAMINER

MONIKANG, GEORGE C

ART UNIT

PAPER NUMBER

2614

MAIL DATE

DELIVERY MODE

02/01/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/802,388	Applicant(s) HERNANDEZ ET AL.	
	Examiner GEORGE C. MONIKANG	Art Unit 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) 6,8-13,16,17,30 and 36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,14,15,18-29,31-35 and 37-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

Art Unit: 2614

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-2, 4-5, 15, 18-22, 24-25, 37, 39 & 41-54 are rejected under 35

U.S.C. 103(a) as being unpatentable over Enzmann et al, US Patent 5844996, in view of Yamazaki, US Patent Pub. 20010012368 A1. (The Enzmann et al reference is cited in IDS filed 3/18/2005)

Re Claim 1, Enzmann et al discloses a system for sound cancellation comprising: a source microphone for detecting sound propagating from a mobile sound source remote from the source microphone (*fig. 1: 36; col. 4, lines 11-28*); at least two speakers configured to direct a canceling sound toward a mobile cancellation location that is spatially remote from the sound source and the speakers (*fig. 1: 18 & 46; col. 4, lines 40-53: speakers 46 direct cancellation sound signals to the non-snoring person, whom is remote from the sound source*), but fails to disclose a source localizing sensor for determining a current location of the sound source; a cancellation space localizing sensor for determining a current location of the mobile cancellation space; and a computational module in communication with the source microphone, the source localizing sensor, the speakers, and the cancellation space localizing sensor, the computational module including a memory storing a situational transfer function of individual transfer functions, each individual transfer function corresponding to at least a sound source location and a cancellation space location, the computational module configured to receive a signal from the microphone, to identify at least one current

Art Unit: 2614

individual transfer function corresponding to the current location of the sound source and the current location of the cancellation location, and to control the speakers to transmit a cancellation sound signal based on the at least one current individual transfer function to the speakers. However, Yamazaki discloses a system with sound source localization sensor capabilities, wherein filter factors corresponding to a head related transfer function are stored, these transfer functions being in relation to different sound source locations such that, when the sound source is at different locations, the appropriate transfer function for that sound source location is utilized and processed in relation to the sound source location and a listener's left and right ears (cancellation location) (*Yamazaki, figs. 1 & 5-6; para 0008*). Therefore, it would have been obvious to improve the Enzmann et al system with the sound source localization abilities of Yamazaki such that when the snorer and non snorer in Enzmann moves, the speakers 46 of Enzmann could provide appropriate cancellation signals that take into account the new locations of the snorer and snorer thus modernizing the system by making it more efficient.

Re Claim 2, the combined teachings of Enzmann et al and Yamazaki disclose the system of claim 1, further comprising a training sub-system having at least one training microphone that can be placed at the cancellation location (*Enzmann, col. 4, lines 33-39*).

Re Claim 4, the combined teachings of Enzmann et al and Yamazaki disclose the system of claim 2, wherein the situational transfer function is determined by receiving a first sound input from the source microphone (*Enzmann et al, fig. 1: 36; col.*

Art Unit: 2614

4, lines 11-28), receiving a second sound input from the training microphone (Enzmann et al, col. 4, lines 33-39), and then determining the adaptive filtering function (Enzmann et al, col. 2, lines 40-43: error signal generated by the noise cancelling signal is picked up by the error microphone 41; since the noise cancelling signal comprises microphone 36 picking up noise signals and generating cancelling signals, the adaptive filter compensates for sound between micmicrophone6 and 41), wherein the predetermined adaptive filtering function is adaptive to a sound transformation between the source microphone signal and the training microphone signal (Enzmann et al, col. 2, lines 40-43: error signal generated by the noise cancelling signal is picked up by the error microphone 41; since the noise cancelling signal comprises microphone 36 picking up noise signals and generating cancelling signals, the adaptive filter compensates for sound between micmicrophone6 and 41).

Re Claim 5, the combined teachings of Enzmann et al and Yamazaki disclose the system of claim 1, wherein the situational transfer function comprises a function that identifies a sound transformation between the source microphone and the cancellation location without contemporaneous sound receiving at the cancellation location (Enzmann et al, col. 7, lines 23-42: error feedback microphone picks up sound signals after the adaptive filter has processed the input noise signals and the speakers are generating noise cancellation signals at which point, the error microphone picks up sound errors for feedback; Therefore the microphone at the cancellation location does not pick up sound contemporary with the adaptive filter function).

Art Unit: 2614

Re Claim 15, the combined teachings of Enzmann et al and Yamazaki disclose the system of claim 1, wherein the speaker comprises a plurality of speakers (Enzmann et al, fig. 1: 46).

Claim 18 has been analyzed and rejected according to claim 1.

Claims 19-22 have been analyzed and rejected according to claim 4.

Re Claim 24, the combined teachings of Enzmann et al and Yamazaki disclose the method of claim 18, wherein providing a situational transfer function of individual transfer functions comprises: detecting first sound at a first location (Enzmann et al, abstract); detecting a modified second sound at a second location, the modified second sound being a result of sound propagating to the second location (Enzmann et al, abstract); determining an adaptive filtering function (Enzmann et al, col. 2, lines 40-43), substantially removed of cross-talk to provide a cancelling sound for cancelling the second sound (Enzmann et al, abstract); halting detecting of the modified sound (Enzmann et al, col. 6, lines 4-8; col. 6, line 66 through col. 7, line 4: discloses noise cancellation occurring only after the modeling circuit uses the input of the error microphone (which picks up signals of the sounds outputting from the speakers) to determine the appropriate filter transfer function; therefore the error microphones detect nothing while the noise cancellation occurs and only detect when in modeling mode before noise cancellation mode); and determining a cancellation signal proximate the second location from the first sound (Enzmann et al, abstract) and the adaptive filtering function (Enzmann et al, col. 2, lines 40-43).

Claim 25 has been analyzed and rejected according to claims 1 & 5.

Re Claim 37, the combined teachings of Enzmann et al and Yamazaki disclose the system of claim 1, wherein the sound source comprises a snoring individual and the speaker is not wearable by the snoring individual (Enzmann et al, fig. 1: 46).

Claims 39 & 41-45 have been analyzed and rejected according to claim 1.

Claims 46, 49, 51 & 54 have been analyzed and rejected according to claim 24.

Claim 47 has been analyzed and rejected according to claims 1 & 4.

Claims 48, 50 & 52 have been analyzed and rejected according to claim 1.

Claim 53 has been analyzed and rejected according to claim 2.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enzmann et al, US Patent 5844996, and Yamazaki, US Patent Pub. 20010012368 A1, as applied to claim 18 above, and further in view of Parkins, US Patent 6665410 B1. (The Enzmann et al reference is cited in IDS filed 3/18/2005)

Re Claim 3, the combined teachings of Enzmann et al and Yamazaki disclose the system of claim 1, but fail to disclose further comprising a temperature sensor in communication with the computational module, wherein the predetermined adaptive filtering function is responsive to the temperature of the acoustic environment as taught in Parkins (Parkins, col. 4, lines 35-49). It would have been obvious to incorporate the temperature sensor of Perkins (Parkins, col. 4, lines 35-49) into the system of Enzmann et al and Yamazaki for the purpose of compensating for the change

Art Unit: 2614

1. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enzmann et al, US Patent 5844996, and Yamazaki, US Patent Pub. 20010012368 A1 as applied to claim 1 above, in view of Raviv's admitted prior art (hereinafter referred to as RAAPA; col. 2, lines 4-14). (The Raviv et al admitted prior art reference is cited in IDS filed 3/18/2005)

Re Claim 7, the combined teachings of Enzmann et al and Yamazaki disclose the system in claim 1, but fail to disclose wherein the source microphone comprises a plurality of source microphones as taught in RAAPA (RAAPA, col. 2, lines 4-14). It would have been obvious to use the multiple microphones of RAAPA (RAAPA, col. 2, lines 4-14) with the system Enzmann et al and Yamazaki for the purpose of the sound source signal better facilitates cancellation.

6. Claims 23 & 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enzmann et al, US Patent 5844996, and Yamazaki, US Patent Pub. 20010012368 A1, as applied to claim 18 above, and further in view of Goldsmith et al, US Patent 6436057 B1. (The Enzmann et al reference is cited in IDS filed 3/18/2005)

7. Re Claim 26, the combined teachings of Enzmann et al and Yamazaki disclose the method of claim 18, but fail to disclose further comprising: analyzing a sound input to determine if a change in respiratory sounds occurs sufficient to identify a health condition comprising abnormal breathing (Goldsmith et al, col. 4, lines 28-36: cough causes abnormal breathing) as taught in Goldsmith et al. It would have been obvious to modify the system of Enzmann and Yamazaki with an analyzer capable to determine

Art Unit: 2614

abnormal breathing as taught in Goldsmith (Goldsmith et al, col. 4, lines 28-36: cough causes abnormal breathing) for the purpose of making the system more dynamic.

8. Claim 23 has been analyzed and rejected according to claim 26.

9.

10. Claims 14, 27-29 & 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enzmann et al, US Patent 5844996, and Yamazaki, US Patent Pub. 20010012368 A1, as applied to claim 1 above, and further in view of Eriksson, US Patent 4677676.

Re Claim 27, the combined teachings of Enzmann et al and Yamazaki disclose a system for sound cancellation comprising: a source microphone for detecting sound (Enzmann et al, abstract); a speaker (Enzmann et al, abstract) configured to transmit a canceling sound configured to cancel the detected sound such that the canceling sound is localized with respect to a cancellation location (Enzmann et al, fig. 1: 18 & 46; col. 4, lines 40-53). Even though, Enzmann et al and Yamazaki fail to disclose the speaker being a parametric speaker, Eriksson discloses a unidirectional speaker array that outputs noise cancelling sounds (Eriksson, col. 5, lines 17-26: unidirectional speaker has a parametric speaker). Thus, it would have been obvious to use a directional/parametric speaker as taught in Eriksson within Enzmann et al and Yamazaki for the purpose of directing the noise cancellation signal to the non snorer.

Claims 14, 28-29 & 31-35 have been analyzed and rejected according to claims 27.

Allowable Subject Matter

1. Claim 38, 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
2. The following is a statement of reasons for the indication of allowable subject matter for claim 38: The prior art does not teach or moderately suggest the following limitations:

Wherein the predetermined adapted filtering function includes a situational transfer matrix function, W , $W = 1/(d \cdot e \cdot e)$ wherein e is a transfer function for sound propagation from the sound source to the source microphone, e is a transfer function for sound propagation from the speaker to the cancellation location, and d is a transfer function for sound propagation from the source microphone to the speaker, and the $*$ operator denotes mathematical convolution.

Limitations such as these may be useful in combination with other limitations of claims 1 & 18 respectively.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GEORGE C. MONIKANG whose telephone number is (571)270-1190. The examiner can normally be reached on M-F. alt Fri. Off 7:30am-5:00pm (est).

Art Unit: 2614

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George C Monikang/
Examiner, Art Unit 2614

1/27/2010

/Vivian Chin/
Supervisory Patent Examiner, Art Unit 2614